

Release notes for ENDF/B Development photoat-083_Bi_000
evaluation

ENDF
B-VII.dev

October 13, 2016

- checkr Warnings:

1. A previous error halted parsing of the current section
MAT=8300, MF= 1, MT=451 (1): Parsing stopped

```
ERROR(S) FOUND IN MAT=8300, MF= 1, MT=451
SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER      167 TO      203
```

- checkr Errors:

1. A variable is outside the allowed ENDF range
MAT=8300, MF= 1, MT=451 (0): Variable range

```
ERROR(S) FOUND IN MAT=8300, MF= 1, MT=451
MOD =      3 OUT OF RANGE      0 -      1      RECORD NUMBER      167
```

2. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=501 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8300, MF=23, MT=501
SECTION 23/501 NOT IN DIRECTORY      RECORD NUMBER      205
```

3. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=502 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8300, MF=23, MT=502
SECTION 23/502 NOT IN DIRECTORY      RECORD NUMBER      1214
```

4. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=504 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8300, MF=23, MT=504
SECTION 23/504 NOT IN DIRECTORY      RECORD NUMBER      1697
```

5. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=515 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8300, MF=23, MT=515
SECTION 23/515 NOT IN DIRECTORY      RECORD NUMBER      1738
```

6. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=516 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8300, MF=23, MT=516
SECTION 23/516 NOT IN DIRECTORY      RECORD NUMBER      1773
```

7. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=517 (0): Directory (b)

ERROR(S) FOUND IN MAT=8300, MF=23, MT=517
SECTION 23/517 NOT IN DIRECTORY RECORD NUMBER 1828

8. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=522 (0): Directory (b)

ERROR(S) FOUND IN MAT=8300, MF=23, MT=522
SECTION 23/522 NOT IN DIRECTORY RECORD NUMBER 1870

9. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=534 (0): Directory (b)

ERROR(S) FOUND IN MAT=8300, MF=23, MT=534
SECTION 23/534 NOT IN DIRECTORY RECORD NUMBER 2332

10. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=535 (0): Directory (b)

ERROR(S) FOUND IN MAT=8300, MF=23, MT=535
SECTION 23/535 NOT IN DIRECTORY RECORD NUMBER 2352

11. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=536 (0): Directory (b)

ERROR(S) FOUND IN MAT=8300, MF=23, MT=536
SECTION 23/536 NOT IN DIRECTORY RECORD NUMBER 2375

12. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=537 (0): Directory (b)

ERROR(S) FOUND IN MAT=8300, MF=23, MT=537
SECTION 23/537 NOT IN DIRECTORY RECORD NUMBER 2397

13. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=538 (0): Directory (b)

ERROR(S) FOUND IN MAT=8300, MF=23, MT=538
SECTION 23/538 NOT IN DIRECTORY RECORD NUMBER 2420

14. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=539 (0): Directory (b)

ERROR(S) FOUND IN MAT=8300, MF=23, MT=539
SECTION 23/539 NOT IN DIRECTORY RECORD NUMBER 2445

15. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=540 (0): Directory (b)

- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=8300, MF=23, MT=540 | RECORD NUMBER | 2473 |
| SECTION 23/540 NOT IN DIRECTORY | | |
16. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=541 (0): Directory (b)
- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=8300, MF=23, MT=541 | RECORD NUMBER | 2501 |
| SECTION 23/541 NOT IN DIRECTORY | | |
17. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=542 (0): Directory (b)
- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=8300, MF=23, MT=542 | RECORD NUMBER | 2531 |
| SECTION 23/542 NOT IN DIRECTORY | | |
18. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=543 (0): Directory (b)
- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=8300, MF=23, MT=543 | RECORD NUMBER | 2562 |
| SECTION 23/543 NOT IN DIRECTORY | | |
19. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=544 (0): Directory (b)
- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=8300, MF=23, MT=544 | RECORD NUMBER | 2590 |
| SECTION 23/544 NOT IN DIRECTORY | | |
20. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=545 (0): Directory (b)
- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=8300, MF=23, MT=545 | RECORD NUMBER | 2622 |
| SECTION 23/545 NOT IN DIRECTORY | | |
21. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=546 (0): Directory (b)
- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=8300, MF=23, MT=546 | RECORD NUMBER | 2656 |
| SECTION 23/546 NOT IN DIRECTORY | | |
22. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=547 (0): Directory (b)
- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=8300, MF=23, MT=547 | RECORD NUMBER | 2699 |
| SECTION 23/547 NOT IN DIRECTORY | | |
23. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=548 (0): Directory (b)

- | | | |
|--|---|--------------------|
| | ERROR(S) FOUND IN MAT=8300, MF=23, MT=548 | |
| | SECTION 23/548 NOT IN DIRECTORY | RECORD NUMBER 2741 |
24. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=549 (0): Directory (b)
- | | | |
|--|---|--------------------|
| | ERROR(S) FOUND IN MAT=8300, MF=23, MT=549 | |
| | SECTION 23/549 NOT IN DIRECTORY | RECORD NUMBER 2801 |
25. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=550 (0): Directory (b)
- | | | |
|--|---|--------------------|
| | ERROR(S) FOUND IN MAT=8300, MF=23, MT=550 | |
| | SECTION 23/550 NOT IN DIRECTORY | RECORD NUMBER 2862 |
26. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=551 (0): Directory (b)
- | | | |
|--|---|--------------------|
| | ERROR(S) FOUND IN MAT=8300, MF=23, MT=551 | |
| | SECTION 23/551 NOT IN DIRECTORY | RECORD NUMBER 2896 |
27. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=552 (0): Directory (b)
- | | | |
|--|---|--------------------|
| | ERROR(S) FOUND IN MAT=8300, MF=23, MT=552 | |
| | SECTION 23/552 NOT IN DIRECTORY | RECORD NUMBER 2939 |
28. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=553 (0): Directory (b)
- | | | |
|--|---|--------------------|
| | ERROR(S) FOUND IN MAT=8300, MF=23, MT=553 | |
| | SECTION 23/553 NOT IN DIRECTORY | RECORD NUMBER 2980 |
29. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=554 (0): Directory (b)
- | | | |
|--|---|--------------------|
| | ERROR(S) FOUND IN MAT=8300, MF=23, MT=554 | |
| | SECTION 23/554 NOT IN DIRECTORY | RECORD NUMBER 3044 |
30. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=559 (0): Directory (b)
- | | | |
|--|---|--------------------|
| | ERROR(S) FOUND IN MAT=8300, MF=23, MT=559 | |
| | SECTION 23/559 NOT IN DIRECTORY | RECORD NUMBER 3108 |
31. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=560 (0): Directory (b)

ERROR(S) FOUND IN MAT=8300, MF=23, MT=560
SECTION 23/560 NOT IN DIRECTORY RECORD NUMBER 3147

32. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=23, MT=561 (0): Directory (b)

ERROR(S) FOUND IN MAT=8300, MF=23, MT=561
SECTION 23/561 NOT IN DIRECTORY RECORD NUMBER 3191

33. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=27, MT=502 (0): Directory (b)

ERROR(S) FOUND IN MAT=8300, MF=27, MT=502
SECTION 27/502 NOT IN DIRECTORY RECORD NUMBER 3236

34. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=27, MT=504 (0): Directory (b)

ERROR(S) FOUND IN MAT=8300, MF=27, MT=504
SECTION 27/504 NOT IN DIRECTORY RECORD NUMBER 3288

35. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=27, MT=505 (0): Directory (b)

ERROR(S) FOUND IN MAT=8300, MF=27, MT=505
SECTION 27/505 NOT IN DIRECTORY RECORD NUMBER 3341

36. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8300, MF=27, MT=506 (0): Directory (b)

ERROR(S) FOUND IN MAT=8300, MF=27, MT=506
SECTION 27/506 NOT IN DIRECTORY RECORD NUMBER 3513

- **linear** Errors:

1. Negative cross section found
0: Neg. Sig(E)

```
Linearize ENDF/B Cross Sections (LINEAR 2015-1)
-----
Retrieval Criteria----- MAT
Monitor Mode----- Off
Minimum Cross Section----- 1.0000E-10 (Default Option)
... [75 more lines]
```

- **fudge-4.0** Warnings:

1. generic warning message
reaction label 0: Bi + gamma [coherent] / Product: gamma (Error # 0): Warning

WARNING: coherentScattering is not a valid distribution component for 2-body reaction

2. FIXME: Generic fudge unimplemented message
reaction label 0: Bi + gamma [coherent] / Product: gamma (Error # 2): Generic unimp (c)

WARNING: Checking not yet implemented for pointwise type data

3. generic warning message
reaction label 1: Bi + gamma [incoherent] / Product: gamma (Error # 0): Warning

WARNING: incoherentScattering is not a valid distribution component for 2-body reaction

4. FIXME: Generic fudge unimplemented message
reaction label 1: Bi + gamma [incoherent] / Product: gamma (Error # 2): Generic unimp (c)

WARNING: Checking not yet implemented for piecewise type data

5. Cross sections do not correctly sum up properly according to an ENDF (or equivalent) sumrule
summedReaction label 28: total (Error # 0): Sumrule

WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 100.00%

6. Cross sections do not correctly sum up properly according to an ENDF (or equivalent) sumrule
summedReaction label 30: photoelectric absorption (Error # 0): Sumrule

WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 64.71%

- fudge-4.0 Errors:

1. Calculated and tabulated thresholds don't agree
reaction label 0: Bi + gamma [coherent] / Cross section: (Error # 0): Threshold mismatch

WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!

2. 2-body reaction not in center-of-mass frame
reaction label 0: Bi + gamma [coherent] / Product: gamma (Error # 1): 2-body not in COM

WARNING: 2-body reaction not in center-of-mass frame!

3. Calculated and tabulated thresholds don't agree
reaction label 1: Bi + gamma [incoherent] / Cross section: (Error # 0): Threshold mismatch

WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!

4. 2-body reaction not in center-of-mass frame
reaction label 1: Bi + gamma [incoherent] / Product: gamma (Error # 1): 2-body not in COM

WARNING: 2-body reaction not in center-of-mass frame!

5. Energy range of data set does not match cross section range
reaction label 1: Bi + gamma [incoherent] / Product: gamma / Distribution incoherentScattering - piecewise: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (0.0 -> 1000000000.0) vs (1.0 -> 1e+11)
6. Calculated and tabulated thresholds don't agree
reaction label 2: e- + e+ + Bi [electron field] / Cross section: (Error # 0): Threshold mismatch

WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 2.044e6 eV!
7. Calculated and tabulated thresholds don't agree
reaction label 3: e- + e+ + Bi [nuclear field] / Cross section: (Error # 0): Threshold mismatch

WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1.022e6 eV!
8. Calculated and tabulated thresholds don't agree
reaction label 4: e- + Bi1s1/2 / Cross section: (Error # 0): Threshold mismatch

WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 90832. eV!
9. Calculated and tabulated thresholds don't agree
reaction label 5: e- + Bi2s1/2 / Cross section: (Error # 0): Threshold mismatch

WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 16376. eV!
10. Calculated and tabulated thresholds don't agree
reaction label 6: e- + Bi2p1/2 / Cross section: (Error # 0): Threshold mismatch

WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 15768. eV!
11. Calculated and tabulated thresholds don't agree
reaction label 7: e- + Bi2p3/2 / Cross section: (Error # 0): Threshold mismatch

WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 13425. eV!
12. Calculated and tabulated thresholds don't agree
reaction label 8: e- + Bi3s1/2 / Cross section: (Error # 0): Threshold mismatch

WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 3973.9 eV!
13. Calculated and tabulated thresholds don't agree
reaction label 9: e- + Bi3p1/2 / Cross section: (Error # 0): Threshold mismatch

WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 3692.7 eV!
14. Calculated and tabulated thresholds don't agree
reaction label 10: e- + Bi3p3/2 / Cross section: (Error # 0): Threshold mismatch

WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 3166.9 eV!
15. Calculated and tabulated thresholds don't agree
reaction label 11: e- + Bi3d3/2 / Cross section: (Error # 0): Threshold mismatch

- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 2698. eV!
16. Calculated and tabulated thresholds don't agree
reaction label 12: $e^- + Bi3d5/2$ / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 2586. eV!
17. Calculated and tabulated thresholds don't agree
reaction label 13: $e^- + Bi4s1/2$ / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 923.4299999999999 eV!
18. Calculated and tabulated thresholds don't agree
reaction label 14: $e^- + Bi4p1/2$ / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 799.4299999999999 eV!
19. Calculated and tabulated thresholds don't agree
reaction label 15: $e^- + Bi4p3/2$ / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 669.16 eV!
20. Calculated and tabulated thresholds don't agree
reaction label 16: $e^- + Bi4d3/2$ / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 464.95 eV!
21. Calculated and tabulated thresholds don't agree
reaction label 17: $e^- + Bi4d5/2$ / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 440.61 eV!
22. Calculated and tabulated thresholds don't agree
reaction label 18: $e^- + Bi4f5/2$ / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 173.87 eV!
23. Calculated and tabulated thresholds don't agree
reaction label 19: $e^- + Bi4f7/2$ / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 168.17 eV!
24. Calculated and tabulated thresholds don't agree
reaction label 20: $e^- + Bi5s1/2$ / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 166.86 eV!
25. Calculated and tabulated thresholds don't agree
reaction label 21: $e^- + Bi5p1/2$ / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 123.12 eV!
26. Calculated and tabulated thresholds don't agree
reaction label 22: $e^- + Bi5p3/2$ / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 97.45999999999999 eV!

27. Calculated and tabulated thresholds don't agree
reaction label 23: e- + Bi5d3/2 / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 35.37 eV!
28. Calculated and tabulated thresholds don't agree
reaction label 24: e- + Bi5d5/2 / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 32.17 eV!
29. Calculated and tabulated thresholds don't agree
reaction label 25: e- + Bi6s1/2 / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 17.69 eV!
30. Calculated and tabulated thresholds don't agree
reaction label 26: e- + Bi6p1/2 / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 8.6 eV!
31. Calculated and tabulated thresholds don't agree
reaction label 27: e- + Bi6p3/2 / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 6.35 eV!
32. Calculated and tabulated thresholds don't agree
summedReaction label 28: total / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!
33. Calculated and tabulated thresholds don't agree
summedReaction label 29: pair product / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1.022e6 eV!
34. Calculated and tabulated thresholds don't agree
summedReaction label 30: photoelectric absorption / Cross section: (Error # 0): Threshold mismatch
- WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 6.35 eV!

- **xsectplotter** Warnings:

1. Encountered runtime warning in xsectplotter or Fudge or matplotlib
Error: RuntimeWarning

```
stderr while processing crossSection
```

```
/usr/local/lib/python2.7/site-packages/matplotlib-1.3.1-py2.7-linux-x86_64.egg/matplotlib/pyplot.py:412: RuntimeWarning:
... [3 more lines]
```